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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,754	02/28/2002	Roger W. Whatmore	112113	3781
7590	10/03/2003			
Oliff & Berridge PO Box 19928 Alexandria, VA 22320			EXAMINER ALANKO, ANITA KAREN	
			ART UNIT	PAPER NUMBER
			1765	
			DATE MAILED: 10/03/2003	

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

10/169,754

Applicant(s)

HANDA ET AL.

Examiner

Anita K Alanko

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: \_\_\_\_

***Claim Rejections - 35 USC § 112***

Claims 2 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 2, line 3, and in claim 8, line 2, the terms “thin” and “low” are relative terms that render the metes and bounds of the claims unclear. They may be simply deleted.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

*Claims 1, 3-5, 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ella (US 6,081,171) in view of Kurle et al (US 6,106,735).*

Ella discloses a filter and method of hermetically packaging the filter including the steps of:

providing a first wafer 103 (Fig.20b) bearing a plurality of bulk acoustic resonators (BAW1, BAW2 in Fig.20b);

providing a second wafer 100 (Fig.20a);

bonding the first and second wafers (Fig.20c, col.30, lines 21-28) to each other to form a composite wafer 100”

Ella does not disclose that the second wafer has a plurality of wells. However, Ella does disclose that the wafers are bonded using solder to form a hermetic seal to protect the electrical components from external contaminants (col.30, lines 55-59).

Kurle teaches a method for protecting arrangements from external influences by forming a hermetic seal (col.4, lines 30-35). Electrical elements 2 are provided in a first wafer 1 and bonded to a second wafer 3. The second wafer has a plurality of wells (created by webs 4). During the bonding electrical elements 2 are aligned with the wells of the second wafer (col.2, lines 56-62; Fig.1D). After bonding, the electrical elements 2 are separated into individual devices (col.3, lines 10-13).

Kurle teaches that wells are not required and that a useful alternative to a second wafer with wells is to use a second wafer without wells (col.4, lines 19-20).

Kurle teaches that a useful alternative for glass frit bonding is to use solder bonding (col.4, lines 21-24).

Kurle thus teaches that hermetic seals can be formed by solder bonding using alignment of wafers with or without wells to wafers with structures that need environmental protection; and then to separate the wafer into individual devices.

It would have been obvious to one with ordinary skill in the art to use the method of Kurle to form a hermetic seal in the method of Ella because Kurle teaches that forming a hermetic seal with wells is a useful alternative to forming a hermetic seal without wells (as in the method of Ella). The method of Ella modified by Kurle teaches the cited method of bonding wafers and aligning wells with BARs of the first wafer and then separating into individual filters.

As to claim 3, Ella teaches that contacts 101a-101f are made to the filters (col.29, lines 49-53) by forming vias. Examiner takes official notice that via contacts are conventionally forming by etching and filling with metal. It would have been obvious to form the vias by etching and to fill them with metal in the modified method of Ella because this is a conventional technique for forming via contacts.

As to claim 4, it would have been obvious to one with ordinary skill in the art to deposit metal after separation to allow contacts to be made in the modified method of Ella in order to form a functional electrical device.

As to claim 5, it would have been obvious to one with ordinary skill in the art to bond a third wafer in the modified method of Ella in order to provide from mechanical stability.

As to claims 7-9, Kurle teaches that a useful alternative to solder (a metal alloy) is glass frit or anodic bonding (col.4, lines 21-29). The low melting point glass bonding is conducted by heat and pressure (col.2, line 60). It would have been obvious to use solder, glass or anodic bonding in the method of Ella because Kurle teaches that they are useful alternative techniques for bonding wafers when forming hermetic seals.

*Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ella (US 6,081,171) in view of Kurle et al (US 6,106,735) and Sparks et al (US 6,062,461).*

The discussion of modified Ella from above is repeated here.

As to claim 2, Ella teaches that the FBARs include a piezoelectric layer 22 sandwiched between two metal electrodes 24, 26 and other layers of materials. However, Kurle does not teach how the wells are formed.

Sparks teaches that when forming a hermetic seal by bonding a first wafer 10 with electrical components 14 to a second wafer 12 with wells 16, that the wells can be formed by etching (col.5, lines 1-2). It would have been obvious to one with ordinary skill in the art to use etching to form the wells in the modified method of Ella because Sparks teaches that etching is a useful technique for forming wells.

As to claim 6, Sparks teaches that bonding under vacuum is a conventional technique (col.5, line 65-col.6, line 8). It would have been obvious to bond under vacuum in the modified method of Ella because Sparks teaches that it is conventional technique to form a hermetic seal.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art shows methods of bonding and packaging.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K Alanko whose telephone number is 703-305-7708. The examiner can normally be reached on Monday, Tuesday and Friday, 8:00 am-4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703-305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

*Anita K. Alanko*

Anita K Alanko  
Primary Examiner  
Art Unit 1765